FACT SHEET

Joliet Army Ammunition Plant
Joliet, Illinois
Operated by Uniroyal, Inc.
(Uniroyal Chemical)

Location: Approximately 10 miles south of Joliet on Illinois Route 53 formerly known as Route 66A.

Size: 23,091 acres - 14,385 acres east of Route 53 and 8,706 acres west of Route 53 (Approximately 36 square miles).

Physical Assets: 1,525 buildings, 250 miles of roads, 170 miles of railroad track, 190 miles of water lines, 4,500 telephones.

Organizational Structure: The Ammunition Procurement and Supply Agency (APSA) is the "home office" of the U. S. conventional military ammunition industry. APSA buys metal parts and components from private industry. Parts are shipped to APSA loading plants. There, they are loaded with explosives from manufacturing plants such as Joliet, assembled into complete rounds, and shipped to depots or troops in the field. APSA also directs the supply of ammunition to Army troops world-wide.

Joliet Army Ammunition Plant (JAAP) is composed of a bulk high explosives manufacturing plant (Manufacturing Unit), and shell and bomb loading, assembly and packaging facilities, commonly known as L.A.P. (Load, Assembly and Pack).

Office of the Contracting Officers Representative (COR), locally based liaison officer between government and operating contractor.

Uniroyal, Inc. (Uniroyal Chemical) operating contractor of JAAP.

Key Officials: Brigadier General Erwin M. Graham, Commanding General, APSA.

Lieutenant Colonel Charles F. Ball, Jr., Commanding Officer of Joliet Army Ammunition Plant.

Louis A. Doherty, Factory Manager, Uniroyal, Inc. (Uniroyal Chemical)

Personnel: APSA - 2,500 employees
Office of the COR - 200 employees
Uniroyal, Inc. - 8,000 employees

UNIROYAL, INC. - DIVERSITY ON A GRAND SCALE

Back when Uniroyal, Inc., went by the more familiar name of U.S. Rubber, the average person found it a little difficult to understand how, or why, the company had been selected to operate the Joliet Army Ammunition Plant.

The situation was somewhat understandable. After all, what seeming relationship is there between the manufacture of tires and the production of high explosives, artillery shells and bombs?

The answer, of course, is that there is a very definite relationship. Even if there wasn't, tire production is only a part of the overall Uniroyal operation; an operation tnat is now so diversified that the company was forced to change its name early this year because the old one simply wasn't descriptive enough.

Tire manufacturing is basically a chemical process, and so is the production of high explosives. The explosives produced here - TNT, Tetryl, Lead Azide (not currently in production) and DNT - are little more than compounds of chemicals that, in themselves, do not possess high explosive properties. They have been produced here exclusively by Uniroyal for an interrupted period of 24 years.

Despite its relationship, experience in tire-building is not the company's chief qualification for the multi-million dollar contract to operate the Joliet Army Ammunition Plant. Fact is, Uniroyal is one of the world's largest producers of chemicals for industrial use, through its Uniroyal Chemical Division of wnich this plant is a part.

Key positions in the high explosives manufacturing portion of the plant are held, for the most part, by transfers from other Uniroyal Chemical plants. Factory Manager L. A. Doherty is one such transfer, and has 26 years of experience with the company, all of it spent in Uniroyal Chemical.

Now, about Uniroyal in general. Through its various divisions, the company

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produces America's largest line of rubber and casual footwear, and a wide assortment of other rubber goods, consumer chemicals, plastics, textiles and synthetic fibers.

In one field, Uniroyal is indisputably the world's largest....production of rubber chemicals. Virtually every rubber product manufactured anywhere - including those of rival tire companies - is exposed to treatment(s) by Uniroyal chemicals.

To provide you with a general idea of the true magnitude of the Uniroyal operation, we submit these facts:

1. It is one of the 50 largest corporations in America - and one of the three largest tire manufacturers in the world - with total assets of $1,011,229,000.

2. In 1967, sales totaled $1,264,697,000 according to Uniroyal's Annual Report to its stockholders.

3. The company employs approximately 70,000 people, and has spent $275,000,000 in the past three years for plant modernization and expansion.

4. It has 48 plants in the continental United States - of which JAAP is the largest - and over 40 additional plants in 17 countries around the world. The latter account for over 33 per cent of total employment.

5. It has sales and distribution offices in more than 100 foreign countries, which account for over 25 per cent of total sales.

6. Uniroyal makes 33,000 products in 1,200 product lines, many of which are inter-related. For example, it not only produces the chemicals and textiles used in manufacturing Uniroyal tires, but grows and processes the raw rubber as well.

7. The company holds several basic patents on the use of radioactive isotopes for industrial purposes.

We could go on and on.

AN INTRODUCTION TO JAAP

JAAP - THE WHAT AND THE WHO OF IT

You probably were aware of the existence of the Joliet Army Ammunition Plant (JAAP) before your visit today, but you would be only typical if you weren't exactly certain what the plant is, what it does or who's involved in its operation.

It is, first of all, wholly owned by the U. S. Government - property, buildings, and equipment - and operated by Uniroyal, Inc., under contract let by the Department of Defense through the Ammunition Procurement and Supply Agency (APSA).

The installation serves as the "home base" of APSA, one of the military organizations that does not make its headquarters in Washington, D.C. From this centrally located point, APSA directs the operations of 25 ammunition plants throughout the country.

The basic mission of JAAP is to safely produce high explosives of the type used in conventional artillery projectiles and aerial bombs, and to load, assemble and package (commonly known as L.A.P.) certain classes of shells, projectiles and bombs.

Plant production facilities are presently operational only in time of conflict and for such time after the cessation of hostilities as is necessary to stockpile sufficient supplies of conventional weapons to meet training needs and possible future conflicts.

It serves the needs of national defense and at the same time pumps literally millions of dollars into the economy of Northern Illinois through not only its multi-million dollar payroll but millions of dollars in local purchasing as well.

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HISTORICALLY SPEAKING

JAAP came into being - under a different name but otherwise very much the same in 1939-40-41, at the outset of World War II. Prior to that time, the vast acreage now occupied by the installation was privately owned farmland.

It was then and still is divided into two production areas, one on the west side of Route 53 where high explosives are manufactured, and another on the east side of Route 53, where artillery shell and bomb loading, assembly and packaging facilities are located. Both units serve as storage and shipping points for their products, and have other production capabilities in addition to those stated.

Originally, the contract for producing high explosives was held by DuPont, and Sanderson and Porter operated the bomb and shell loading, assembly and packaging operation of the plant.

Uniroyal (then known as U. S. Rubber) entered the picture in 1944 when it was awarded the contract for the high explosives manufacturing operation. The company has continued to conduct that operation for an interrupted period of 24 years.

It wasn't until 1966 that Uniroyal contracted to handle the shell and bomb loading, assembly and packaging operation as well. Immediately after the end of World War II, Department of the Army military and civilian personnel took over that element of the plant, operating it until 1964.

THE VASTNESS OF IT ALL

The plant covers an immense area of over 23,000 acres, or approximately 36 square miles. That's slightly larger than Miami, Florida, and 21 square miles larger than Joliet. At one time, in World War II, the plant covered over 32,000 acres, but has been reduced in size while maintaining full production capability and satisfying all safety requirements.

The L.A.P. Unit is by far the more sizeable of the production areas, encompassing 14,385 acres. The Manufacturing Unit rests on 8,706 acres.

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At first glance, it might appear that a great deal of the acreage is unneeded and unused. In reality, each and every acre is not only necessary but put to good use.

The very nature of the end products of the manufacturing processes makes it mandatory that the processes themselves and the area in which they take place be widely separated. Every precaution is taken to avoid accidents, but should an accident happen, damage, both to employees and property, is held to a bare minimum by the widely spread nature of production facilities.

It is also necessary to maintain a wide "buffer zone" between production and storage areas and the boundaries of the installation.

Suitable property not in use for production purposes and not located in potential danger zones is leased to farmers for the planting of non-price-supported crops or pasturing of animals. A full-time land manager is employed by Uniroyal to handle leasing of farmland, rotation of crops and grazing land. The leases return more than $200,000 per year to the government.

Combined, the L.A.P. and Manufacturing Units have 170 miles of railroad track, 250 miles of roadway and 1,525 buildings. Waterlines which serve the two units cover 190 miles. It is not at all uncommon for a supervisor to drive 40 to 50 miles in the course of a day's work without leaving the plant.

Uniroyal, Inc. presently employees approximately 8,000 persons at Joliet Army Ammunition Plant and this total will meet current production demands. There is a normal fluctuation as employees terminate and new hires are required for replacement. Therefore, Uniroyal must continue an aggressive recruitment program at the installation.

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THE MANUFACTURING UNIT - ITS PRODUCTS, FEATURES

The high explosives produced on the Manufacturing side of the plant are TNT (tri-nitro-toluene), the main charge used in most conventional artillery projectiles and bombs; Tetryl, a booster charge used to detonate TNT; Lead Azide (not currently being produced), a highly sensitive explosive compound used principally in the fuse which detonates the booster charge and DNT, a propellant.

Sulfuric and nitric acids, employed in the manufacturing of TNT, are also produced at the Manufacturing Unit west of Rte. 53.

There are 12 TNT and 12 Tetryl production lines located on the installation. Utilization of these lines is dependent on the Army's product demand. Presently, there are ten TNT and six Tetryl production lines in operation.

On the Manufacturing side are also located the main administrative offices of APSA, COR, and Uniroyal, a small fully staffed hospital, the installation motor pool, a fire station with the latest in fire fighting equipment for all types of fires, a rather remarkable $8 million "Red Water" Filtration Plant, a shop with a capability of repairing practically anything, heat and electrical power plants and a great number of magazines for high explosives storage, to mention only a few of the features.

THE L.A.P. UNIT - SHELLS AND BOMBS FOR OUR BOYS

The various "groups"of the L.A.P. Unit are capable of turning out artillery shells and projectiles of a wide variety of calibers, as well as air munition, land mines, demolition charges and fuses.

Groups 1 and 3 are producing 105-millimeter artillery shells, the former at currently planned capacity. On Aug. 20, 1968, Group 1 produced its 10,000,000 round of 105's. Group 2 is the local manufacturing point for eight-inch projectiles, used by both Army and Navy gunners. Group 3A produces cluster bombs for the Air Force and Navy. A small supplementary charge is also manufactured,

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along with the 105-millimeter shells, in Group 3.

In the spring of 1969, Groups 4 and 7 will be reactivated for production of a 40 mm grenade shell. It can be fired out of special rifles or from a special grenade launcher which can be attached to the end of the M-16 rifle. The M-79 launcher (known as the beautiful seventy-niner by infantrymen), which fires the 40 mm shells, enables the infantrymen to have in one weapon, the mince-meat firepower of the M-16 and the knockout punch of a short-range mortar - more and faster lead than any other foot soldier in history.

The reactivation of Groups 4 and 7 will require at least an additional 600 employees.

Whereas the explosive production is accomplished mainly by men, the gals, with their superior manual dexterity, have been found better suited to the L.A.P. job.

WE'RE PRACTICALLY SELF-SUSTAINING

The plant in its entirety is virtually self-sustaining. It can generate its own power - and could supply enough additional to serve the city of Joliet - has its own sizeable combined police and fire departments which are equipped with all the latest equipment, waste disposal facilities, cafeterias, maintenance equipment for everything including roads, a laundry, two fully staffed hospitals (one on each side), housing for military personnel, taxi, limousineand bus service, railroad equipment, trucks and cars and even some recreational facilities.

JAAP does have to depend upon the "outside world" for food, clothing, certain types of equipment and raw materials. Purchasing of these items funnel large sums of money into the area economy.

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YOUR SAFETY AND OURS - A PRIME CONCERN

It's doubtful whether it is possible to overemphasize safety at a plant such as this, but if it is possible, JAAP pleads guilty.

Safety is our first concern even over production, and every conceivable precaution is taken.

Each production building is assigned a "man-limit", and under no circumstances will more than the specified number of people be allowed in the building at one time. If, for example, you have permission to enter, but the building is already filled to its specified capacity, someone must leave before you can enter.

Smoking is forbidden in all production and testing areas, and even the carrying of matches or lighters is taboo.

Plant guards are authorized to search employees in the production area at any time - even the factory manager is subject to search - and to be found with matches or a lighter is grounds for dismissal.

The latest in protective and safety clothing is issued to employees, including helmets, safety glasses and shoes with soles that "ground" static electricity. Personnel working production of sulfuric and nitric acids wear clothing made of a synthetic fiber called "Dynel" which resists acid.

Special high-velocity showers are provided throughout the production area for use in the event that an employee comes in contact with acid. Further, employees who work in the actual manufacturing areas are required to shower each day after work, using an indicator soap which will reveal

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the presence of contamination on the body.

Vehicles driven in production areas are equipped with speical devices to prevent the exhaust system from emitting sparks. These and countless other precautionary measures and production techniques have enabled JAAP to write a job safety story that is one of the most enviable in American industry.

Uniroyal, Inc. has compiled an enviable safety record during its operation at Joliet Army Ammunition Plant. A new all-time safety record of 7,002,836 manhours worked without a lost time accident was set in 1968. The company's safety record at JAAP compares favorably with other industrial complexes despite the nature of the product produced at the installation.

Community concern has sombimes been voiced because of the policy of transporting TNT by conventional means, i.e., trucks and railroad cars.

In reality, a truckload of TNT is no more dangerous than a truck-load of gasoline, and less dangerous than some of the other fuels transported by truck.

TNT is a very stable explosive and, under the conditions in which shipped, will burn rather than explode.

OPERATIONAL CONTRACT - A TAXPAYERS' JOY

Uniroyal contracted for the operation of JAAP on a "cost plus fixed fee" basis, which isn't quite what it sounds.

The government pays the actual cost of operating the plant plus a set fee for services rendered. The latter amounts to what would be called profit in other areas of the Uniroyal operation.

The company cannot, however, merely turn in a bill for costs and

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expect payment. There are very definite cost guidelines, established by the government, which Uniroyal must stay within.

Thus, it is hardly an operation characterized by extravagance. Quite to the contrary, every known economy measure is taken, and new ones are sought constantly in an effort to keep the expense to a bare minimum.

Employees are strongly encouraged to submit ideas for cutting cost, and have done an admirable job.

At no time is quality or safety sacrificed, however.

Many of the wastes from the production of high explosives are reclaimed and used over again, so that there is relatively little real waste material.

THE WATER'S RED THEN PURE

The disposal of liquid wastes from the purifying process of TNT was once a grave problem, but no more, thanks to an $8 million structure called the "red water" Filtration Plant.

The "plant within a plant" was completed by the Army Corps of Engineers in the summer of 1966, and turned over to Uniroyal for operation. It performs the task of removing harmful substances from the water which carries waste materials away from the production lines.

The filtration plant derives its name from the fact that the waste-bearing water it filters is a brownish red in color when it begins the purifying process.

FINALLY, OUR IMPACT ON THE AREA

The operation of JAAP, though undesireable from the standpoint that it occurs only in time of conflict, provides the economy of the immediate area with a real shot in the arm.

But before we detail our contributions, permit us to correct one slight misunderstanding.

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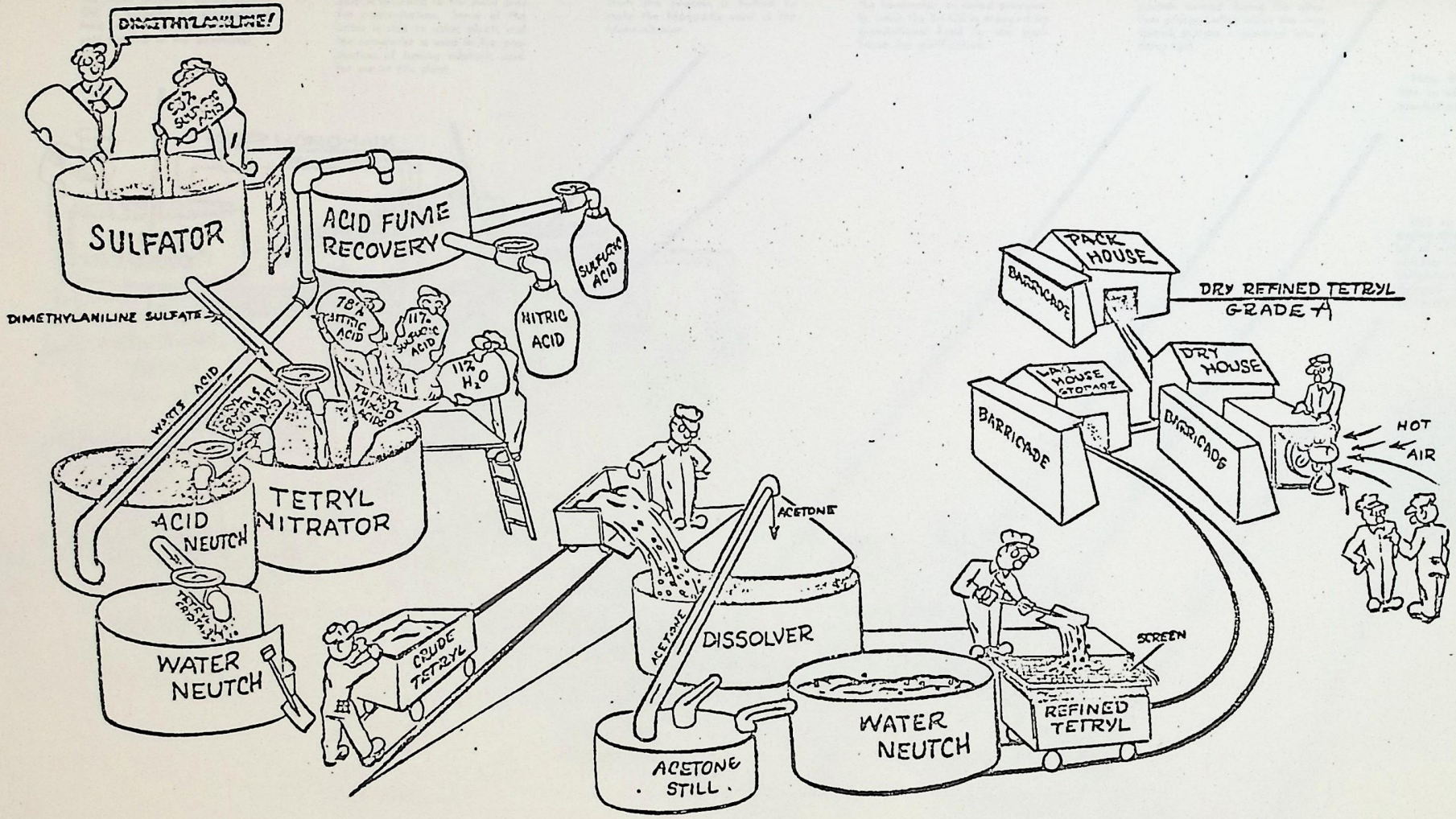
THE PRODUCTION OF OUR END PRODUCT: TETRYL



Mix, a composition of waste acids from the bi-nitrator strengthened with the recovered nitric acid. Waste from this nitration is sent to the Acid Recovery house while the main product, called Mono-Oil, is dropped by gravitational feed into a tank where it is held until needed in the bi-nitrator.

The Mono-House is supplied ... into nitric and sulphuric acids. Nitric is used in butting (strengthening) wastes from the bi-and tri-nitration processes. The sulphuric acid is returned to the Acid area for concentration. Some of the latter is sold to other plants and the remainder is used in the production of fuming sulphuric acid for use at this plant.

strengthened with nitric acid, resulting in Bi-Oil. The Bi-Oil is blown to the tri-nitrator by use of compressed air. The waste from this process is butted to make the Mono-Mix used in the Mono-nitrator.

Tri-Mix, which is a combination of strong sulphuric and nitric acids. The resulting oil is Tri-Oil or TNT. The waste is returned to the bi-nitrator, as noted previously, while the Tri-Oil is dropped by gravitational feed to the wash house for purification.

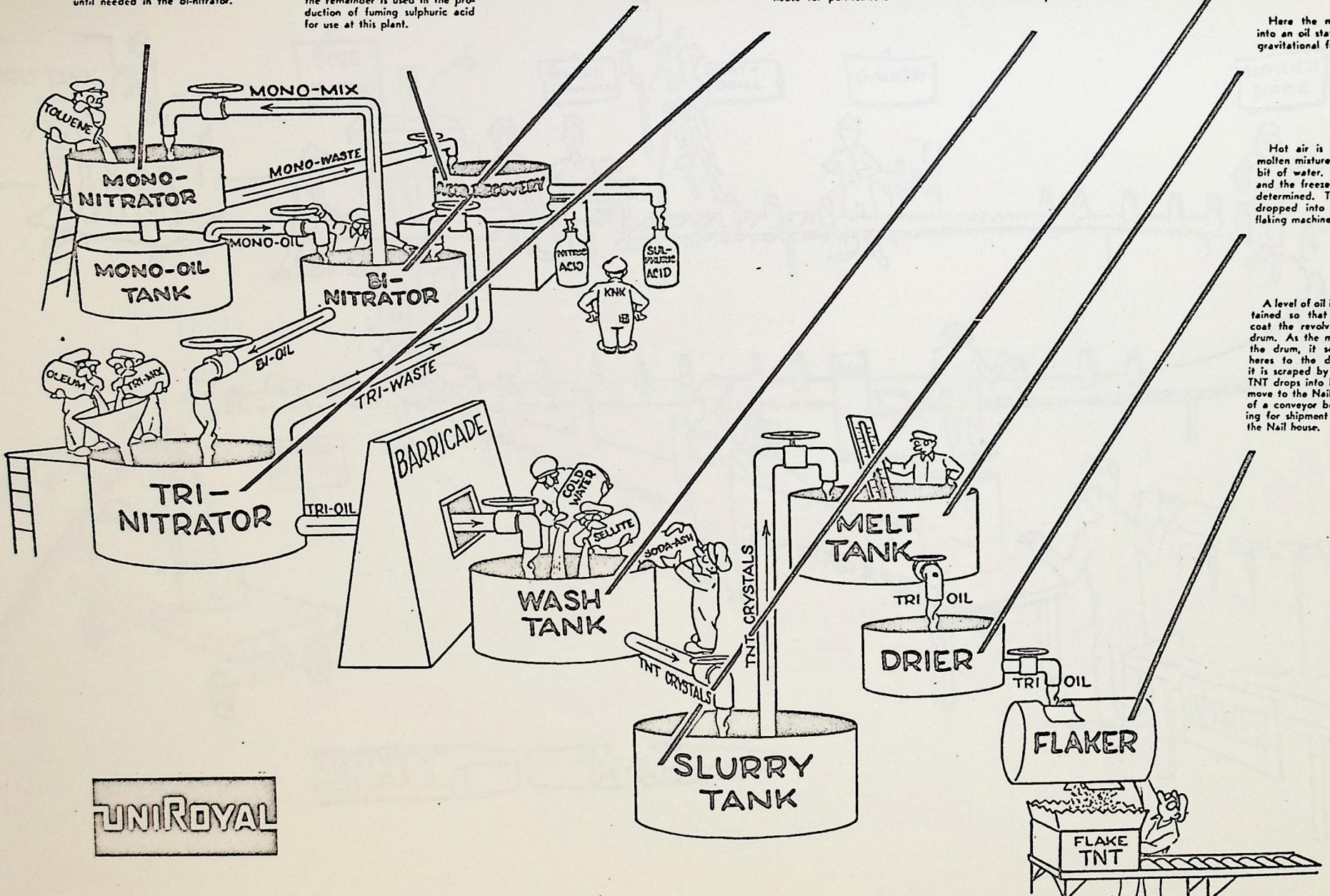
... acid is introduced to neutralize any acid which might still remain in the Tri-Oil. Sellite is then added to remove any unstable compounds formed during the nitration process, after which the crystalized mixture is pumped into a slurry tank.

The mixture is then pumped into a melt tank.

Here the mixture is remelted into an oil state and dropped by gravitational feed into a drier.

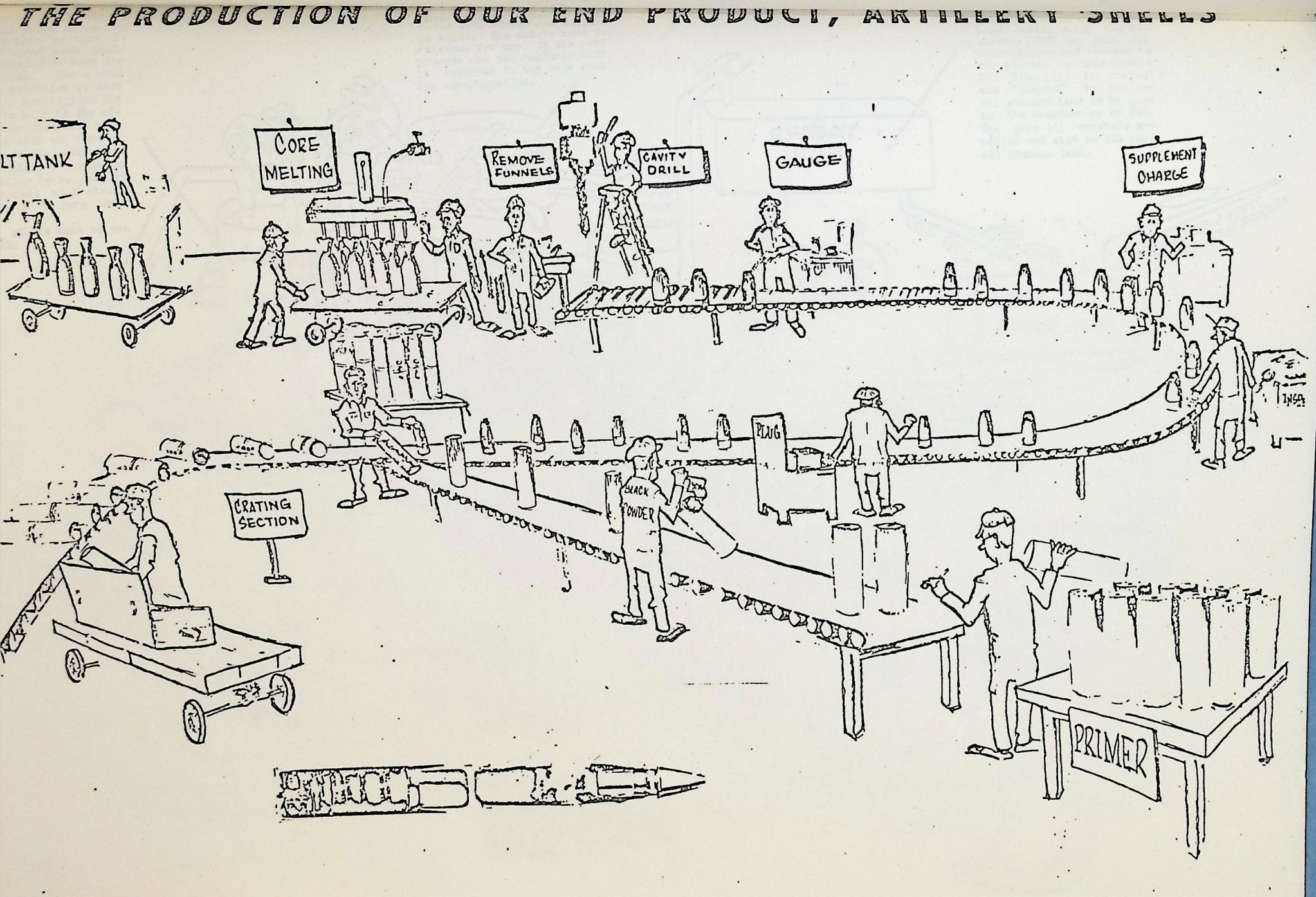
Hot air is blown through the molten mixture to remove the last bit of water. Samples are taken and the freeze point of the oil is determined. Then the dry oil is dropped into a pan under the flaking machine.

A level of oil in the pan is maintained so that the mixture will coat the revolving, water-cooled drum. As the molten oil touches the drum, it solidifies and adheres to the drum from which it is scraped by a blade. Flaked TNT drops into boxes which then move to the Nail house by means of a conveyor belt. The packaging for shipment is completed in the Nail house.



UNIROYAL

THE PRODUCTION OF OUR END PRODUCT, ARTILLERY SHELLS



Toluene is added to cycling acid; to this mixture is added DNT mixed acid (sulfuric & nitric) to form the mononitration. Waste acid from this nitration is sent to the Acid Recovery and the mono oil is held in the nitrator to be nitrated with mono mixed acid to form bi oil. The waste acid from this nitration is sent to the fortifier to be butted (strengthened) with strong nitric acid to form mono mix.
The bi oil is sent to the wash tank.

Here the mono waste acid is separated into nitric and sulfuric acids. The nitric acid is retained for use in the TNT process and the sulfuric acid is returned to the acid area for concentration.

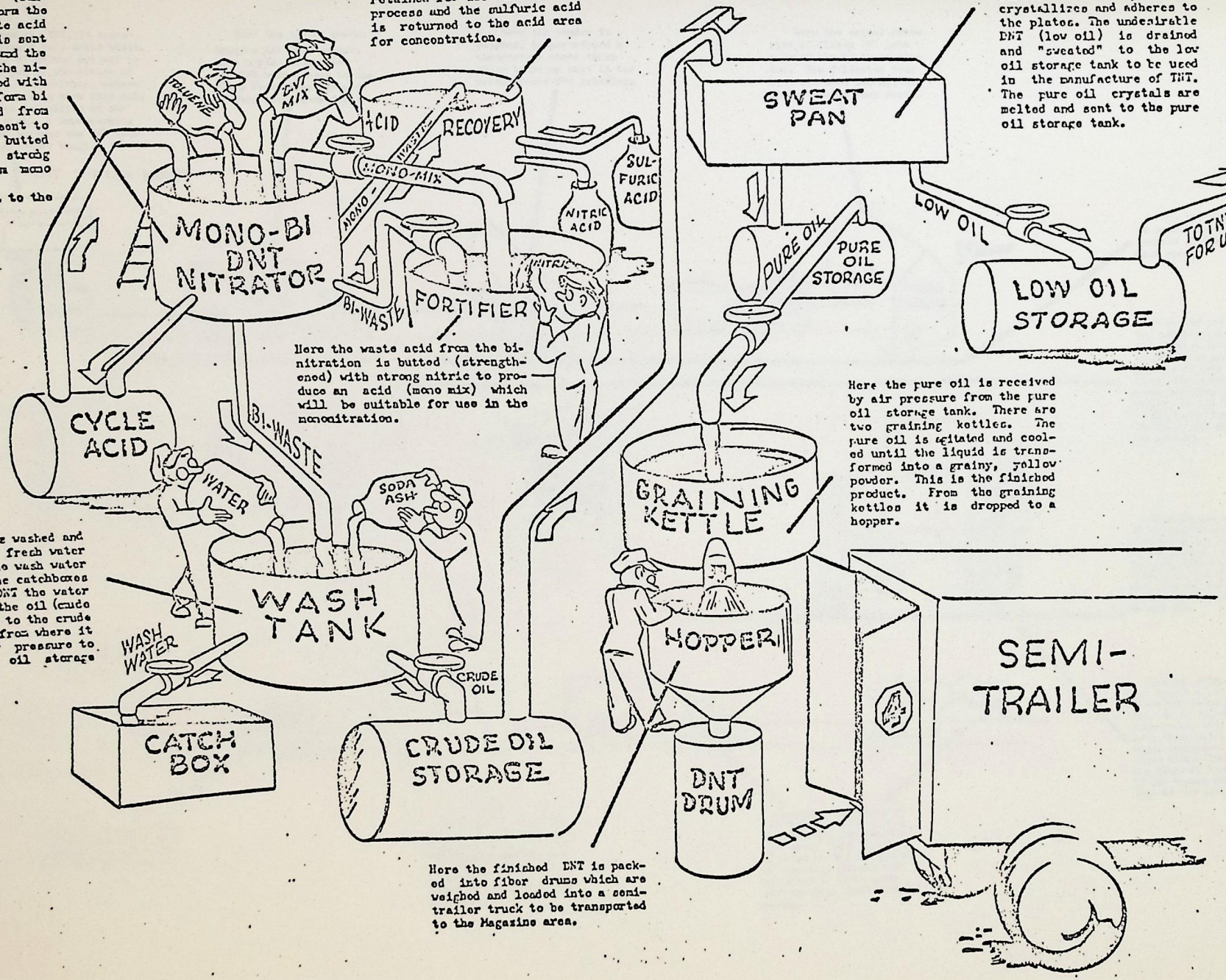
Here the waste acid from the bi-nitration is butted (strengthened) with strong nitric to produce an acid (mono mix) which will be suitable for use in the mononitration.

Here the bi oil is washed and neutralized with fresh water and soda ash. The wash water is drained to the catchboxes to reclaim the DNT the water may contain and the oil (crude oil) is dropped to the crude oil blow case from where it is blown by air pressure to the DNT crude oil storage tank.

Here the finished DNT is packed into fiber drums which are weighed and loaded into a semi-trailer truck to be transported to the Magazine area.

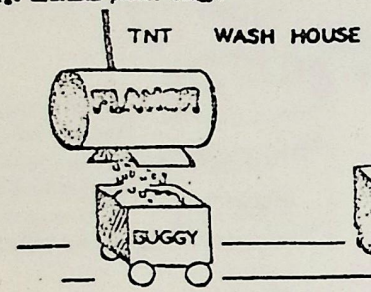
cooling process takes place here during which the desirable DNT or pure oil crystallizes and adheres to the plates. The undesirable DNT (low oil) is drained and "sweated" to the low oil storage tank to be used in the manufacture of TNT. The pure oil crystals are melted and sent to the pure oil storage tank.

Here the pure oil is received by air pressure from the pure oil storage tank. There are two graining kettles. The pure oil is agitated and cooled until the liquid is transformed into a grainy, yellow powder. This is the finished product. From the graining kettles it is dropped to a hopper.

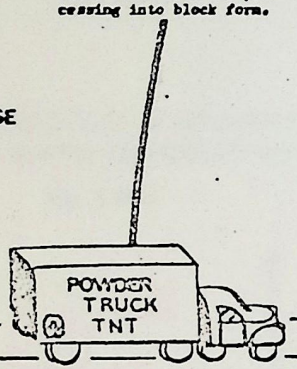


PRODUCTION OF OUR END PRODUCT: TNT BLOCK

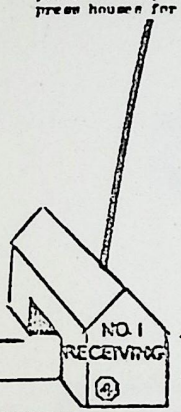
Here the product, TNT, is transformed from a liquid to a solid state. A constant level of molten tri oil is maintained in a pan at the bottom of the flaker drum. A revolving, water-cooled drum then passes thru this oil, which adheres and solidifies on the outside of the drum. A non-sparking metal blade then scrapes the TNT into a large aluminum powder buggy.



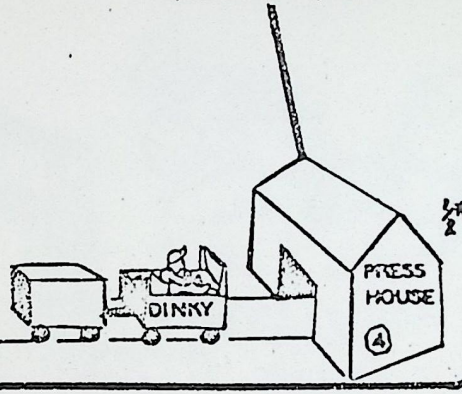
Here the loaded powder buggies are transported in a closed truck from the TNT wash houses to the Block Press area for processing into block form.



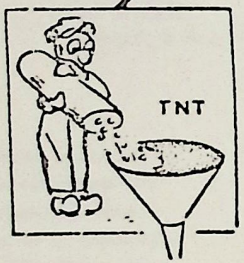
Here the powder is weighed, inspected and a temperature check taken prior to being sent to the press houses for pressing.

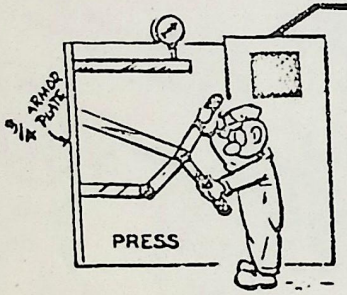


Here the actual pressing of flaked TNT into 2 pound blocks is completed. The following four diagrams show the actual operations as they occur.

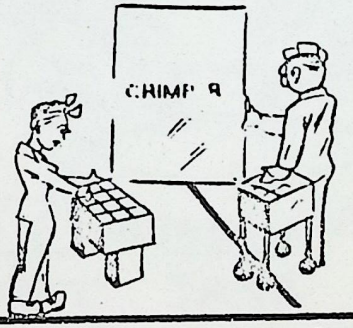


Here the flaked TNT is poured into a hopper located at the rear of each press.

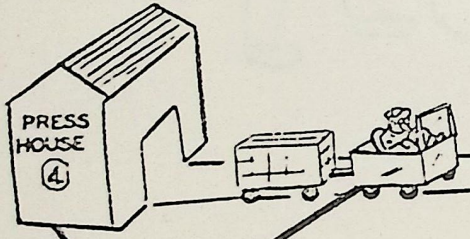




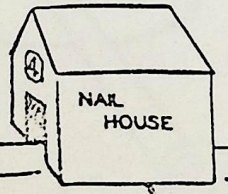
Here the press operator manipulates the controls which feeds powder to the press and then presses it into block form. The operators are protected from possible injury, at all times, by a 3/4" armor plating on the front and sides of all presses.



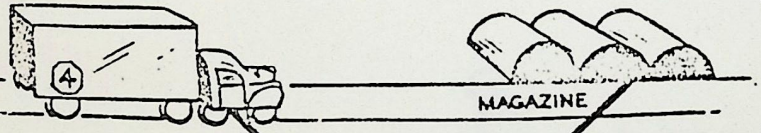
Here the pressed block slides out thru a chute located on the right side of the press. Another operator then checks the weight of each block and then inserts the block in a cardboard container to be crimped.



Here the finished boxes are transported to the nailhouse for final preparations for shipment.



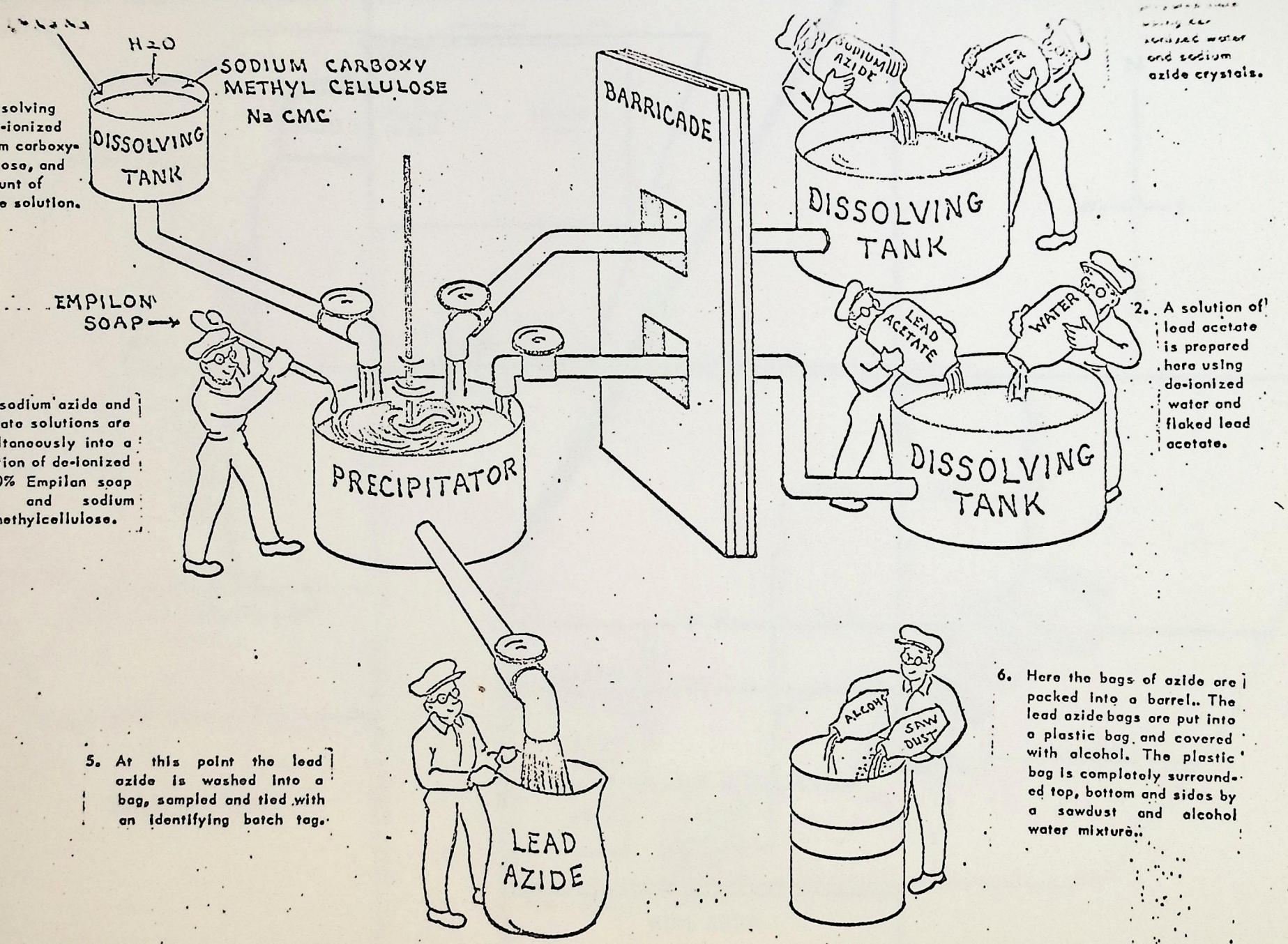
Here the 50 lb. boxes are nailed, inspected and stenciled as to date, lot number, load number, etc,. The finished boxes are then loaded into trailers stationed at the rear of the nailhouse.



Here the finished product is transported, in a closed truck, to the magazine area. Here thousands of boxes of TNT are stored in concrete, quonset type buildings to await shipment to their final destination.

Here the crimper operator places a lid on each block and feeds the block into an air driven crimping press, thus sealing each block within a cardboard container. Another helper then packs the finished blocks into 50 lb. wooden boxes to be sent to the nailhouse.

PRODUCTION OF OUR END PRODUCT: SP. PUR. LEAD AZIDE



3. Into this dissolving tank goes de-ionized water, sodium carboxy-methylcellulose, and a small amount of sodium azide solution.

4. Here the sodium azide and lead acetate solutions are fed simultaneously into a heel solution of de-ionized water, 10% Empilan soap solution and sodium carboxymethylcellulose.

5. At this point the lead azide is washed into a bag, sampled and tied with an identifying batch tag.

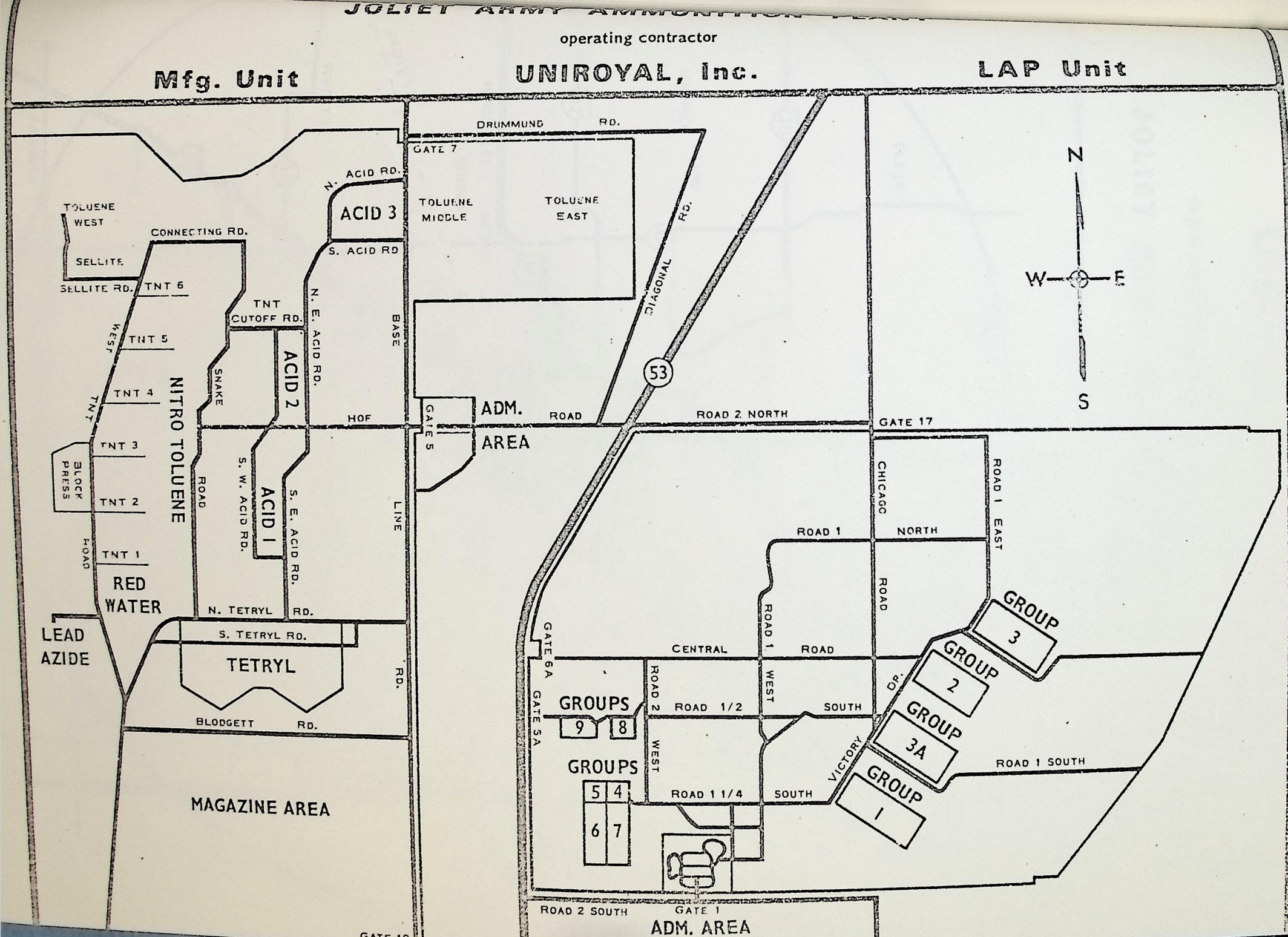
2. A solution of lead acetate is prepared here using de-ionized water and flaked lead acetate.

6. Here the bags of azide are packed into a barrel.. The lead azide bags are put into a plastic bag and covered with alcohol. The plastic bag is completely surrounded top, bottom and sides by a sawdust and alcohol water mixture..

JOLIET ARMY AMMUNITION PLANT

operating contractor

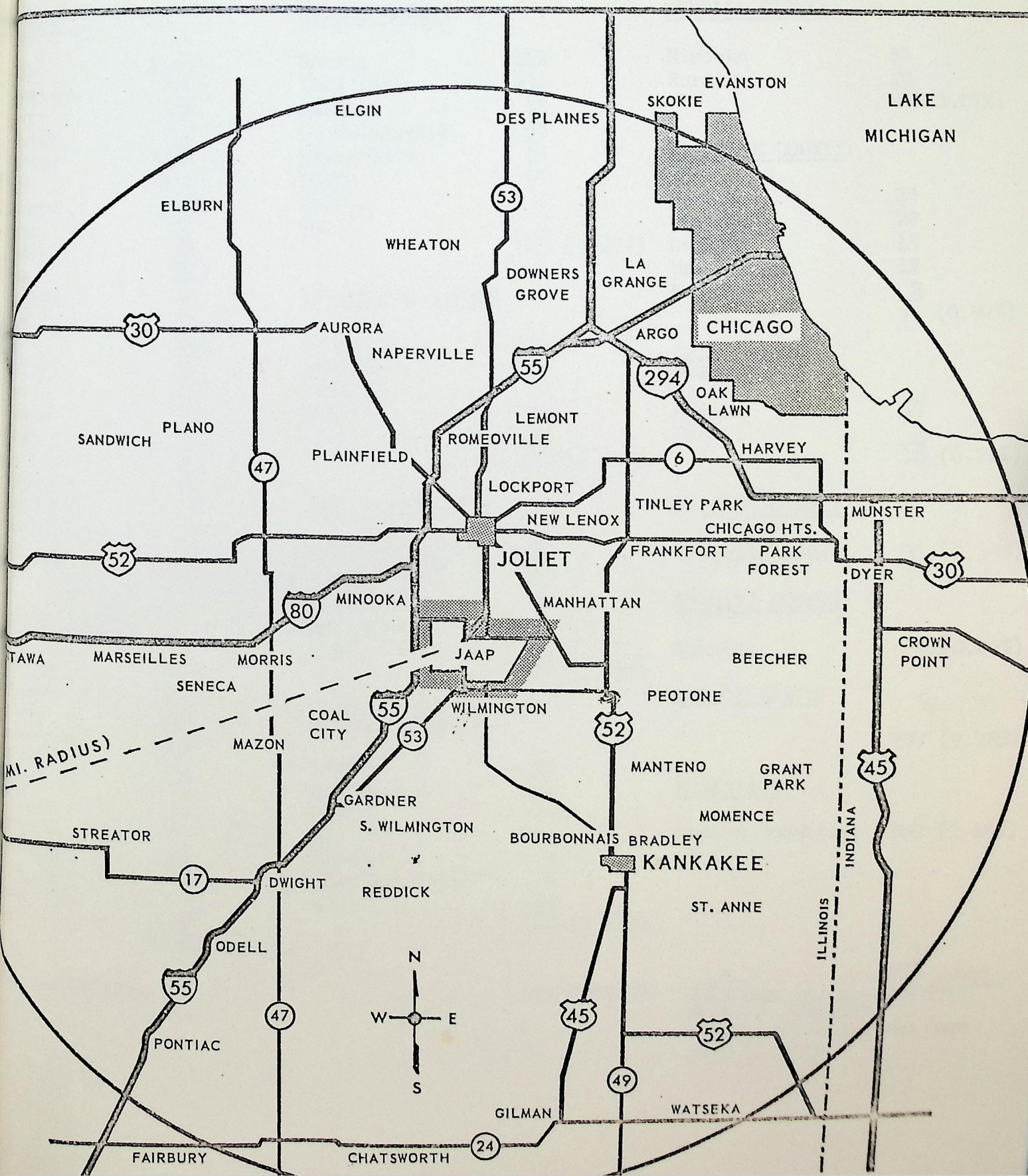
Mfg. Unit — **UNIROYAL, Inc.** — **LAP Unit**



UNIROYAL, Inc.

operating contractor for the

JOLIET ARMY AMMUNITION PLANT



UNIROYAL, Inc.
Joliet Army Ammunition Plant
P. O. Box 871
Joliet, Illinois 60434

PERSONNEL DISTRIBUTION - JUNE 30, 1968

COUNTY		
et	2189	
ington	589	
port	528	
dwood	160	
ttan	139	
od	134	
Lenox	116	
one	70	
nfield	69	
na	62	
nahon	36	
er Park	33	
e	24	
kfort	24	
er	22	
dale	18	
her	16	
t Hill	12	
oville	8	
ewood	8	
e	5	
l	0	
	4262	(52.97%)

AKEE COUNTY		
kakee	514	
dley	169	
eno	155	
rbonnais	154	
ence	55	
ex	52	
Anne	50	
field	23	
kingham	13	
nt Park	12	
na Park	5	
al	27	
	1229	(15.27%)

AL EMPLOYEES	
	7871

GRUNDY COUNTY		
Morris	242	
Coal City	234	
Gardner	73	
S. Wilmington	56	
Braceville	53	
Mazon	40	
Verona	10	
Rural	0	
	708	(8.80%)

LIVINGSTON COUNTY		
Dwight	102	
Pontiac	40	
Reddick	17	
Odell	14	
Rural	32	
	205	(2.55%)

COOK COUNTY		
So. Suburbs	154	
Lemont	53	
Chicago	46	
No. Suburbs	24	
Tinley Park	19	
	296	(3.68%)

IROQUOIS COUNTY		
Watseka	36	
Chebanse	31	
Onarga	16	
Clifton	11	
Gilman	8	
Crescent City	4	
Rural	42	
	148	(1.84%)

KENDALL COUNTY		
Minooka	66	
Rural	20	
	86	(1.07%)

LA SALLE COUNTY		
Seneca	25	
Streator	20	
Ottawa	15	
Marseilles	12	
Rural	2	
	74	(0.92%)

KANE COUNTY		
Aurora	17	
Rural	1	
	18	(0.22%)

DU PAGE COUNTY		
Miscellaneous	31	(0.39%)

DE WITT COUNTY		
Clinton	2	(0.02%)

OUT OF STATE		
	787	(9.78%)

DOWNSTATE		
Beyond Commuting	200	(2.49%)

Prepared by: Diane J. Heatter
Diane J. Heatter
Industrial Relations Dept.
July 1, 1968